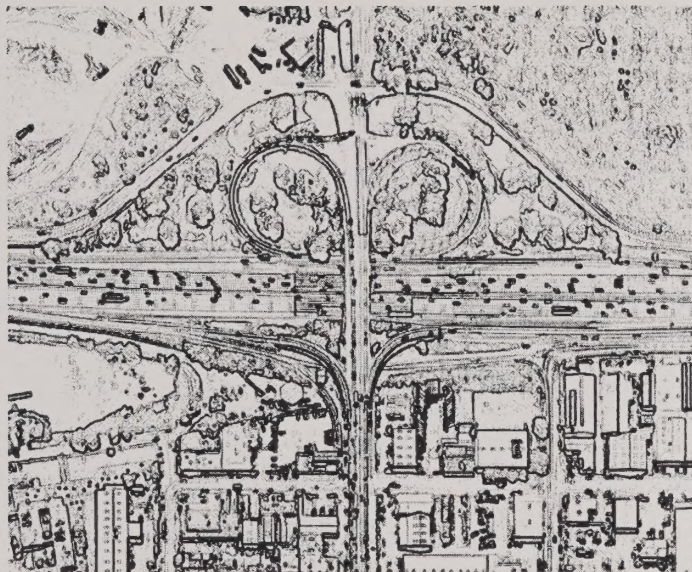




Design Constraints and Opportunities for the Berkeley I-80 Bike/Pedestrian Bridge Project

April 1997

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Introduction

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II. Project Study Area and Summary of Findings

The project Study area includes the area between Bancroft Avenue and Virginia Street, and between Fifth Street and West Frontage Road.

1 Touch-Down Locations

Three locations within the study area have been identified as potential bridge touch-down locations as shown on the following pages. The matrix below summarizes the findings of this report with respect to touch-down location.

ISSUE	RATING		
Use Issues:	Aquatic Park	Hearst	Virginia
Compatibility with Existing Uses and Zoning	good	fair	poor
Compatibility with Vehicular Traffic	good	poor	poor
Proximity to Existing Commercial Development/Pedestrian Traffic	fair	good	fair
Proximity to Parkland/Recreational Areas	good	fair	poor
Aesthetics of Existing Streetscape	good	fair	poor
Public Safety (Crime)	fair	fair	fair
Ramp Geometry (need for tight turns etc.)	good	poor	good
Design & Construction Issues:			
Conflicts with Natural Environment	poor	good	good
Conflicts with Existing Facilities	poor	poor	poor
Presence of Hazardous Materials	good	poor	fair
Administrative Issues:			
Right-of-Way Acquisition issues	good	poor	poor
Potential Delay Issues	fair	poor	poor
Regulatory Issues	poor	fair	good
Cost of Construction	fair	poor	good

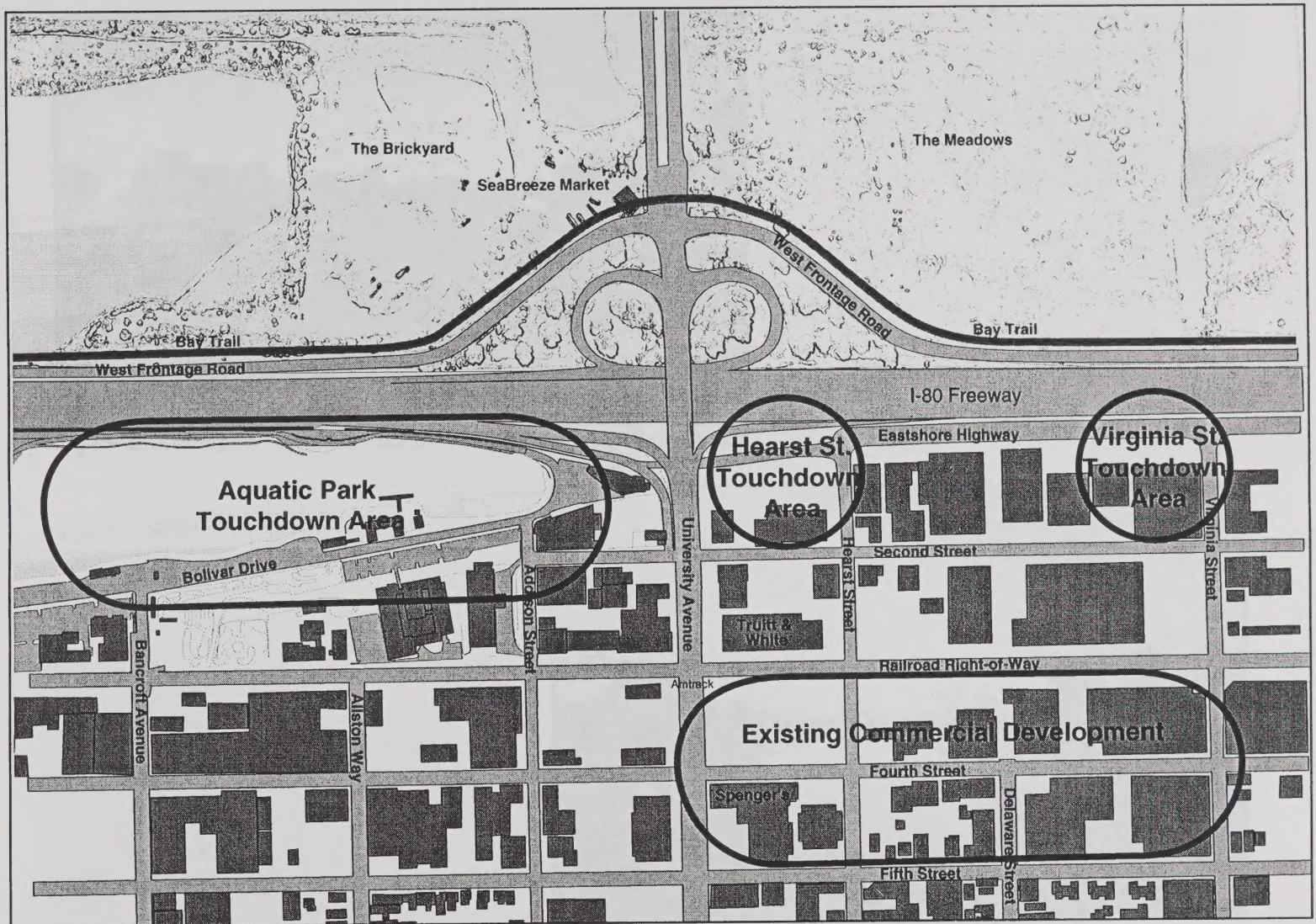
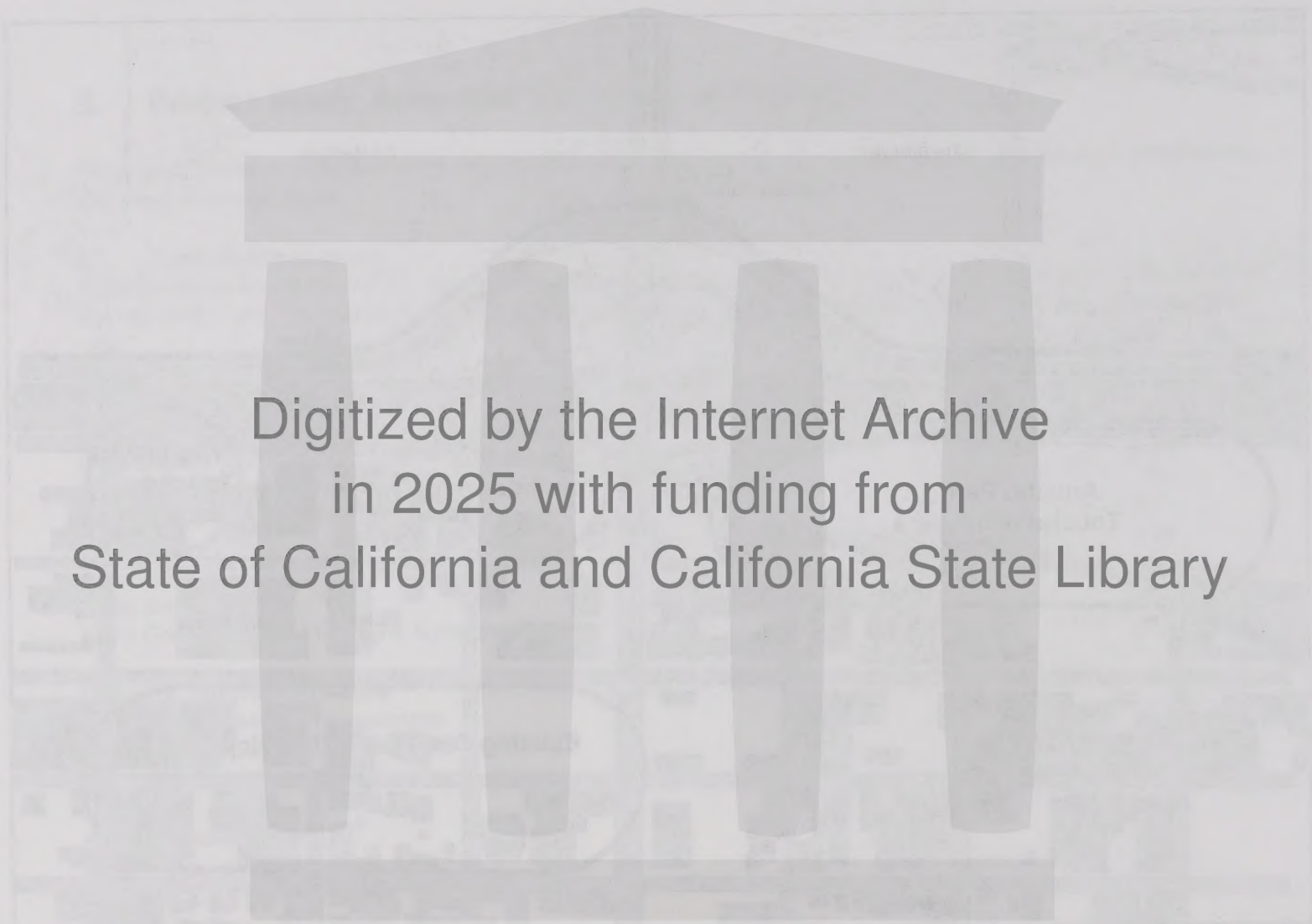


Figure 1: Eastside Ramp Touch-down Locations



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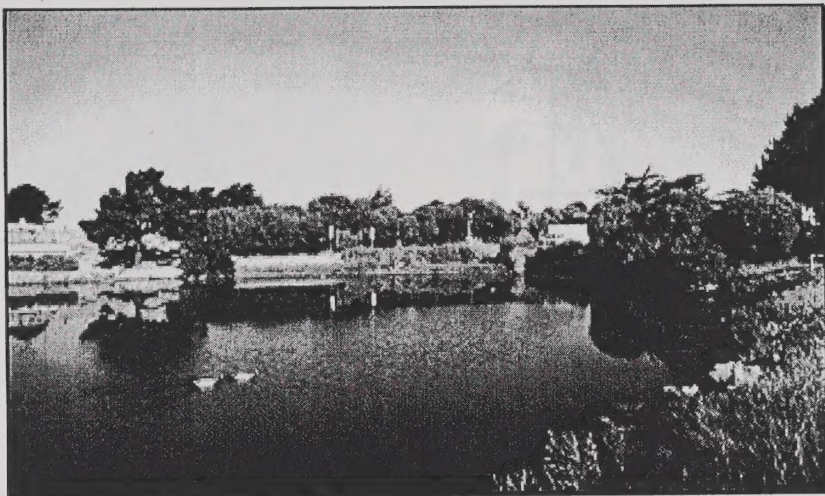


Figure 2: Looking northwest at northern tip of Aquatic Park Lagoon

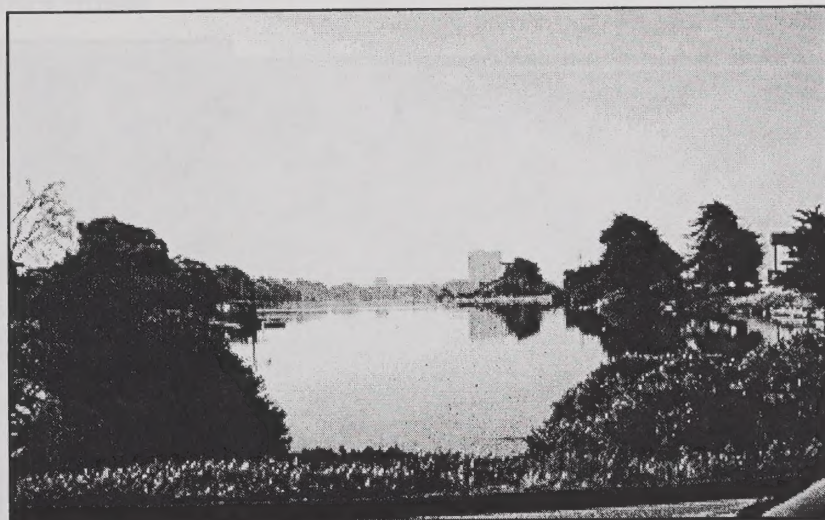


Figure 3: Looking South from north end of Aquatic Park

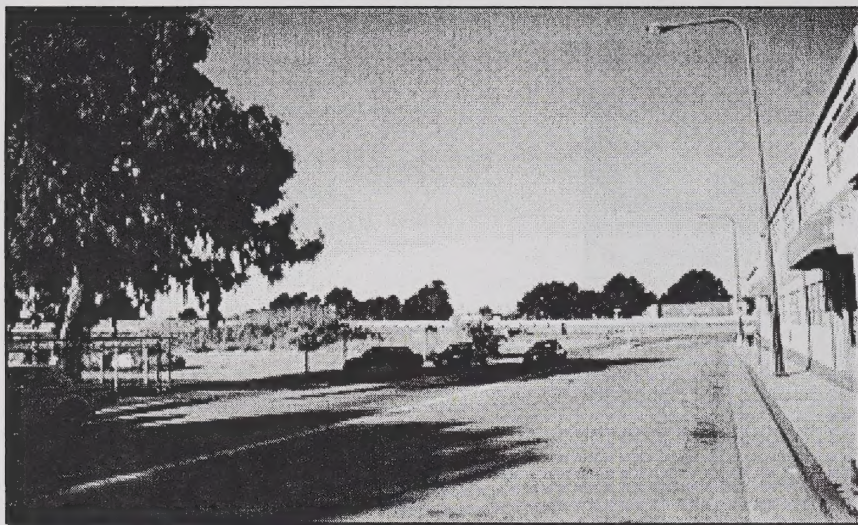


Figure 4: Looking west at foot of Hearst Street



Figure 5: Looking South on Eastshore Hwy. towards Hearst Street

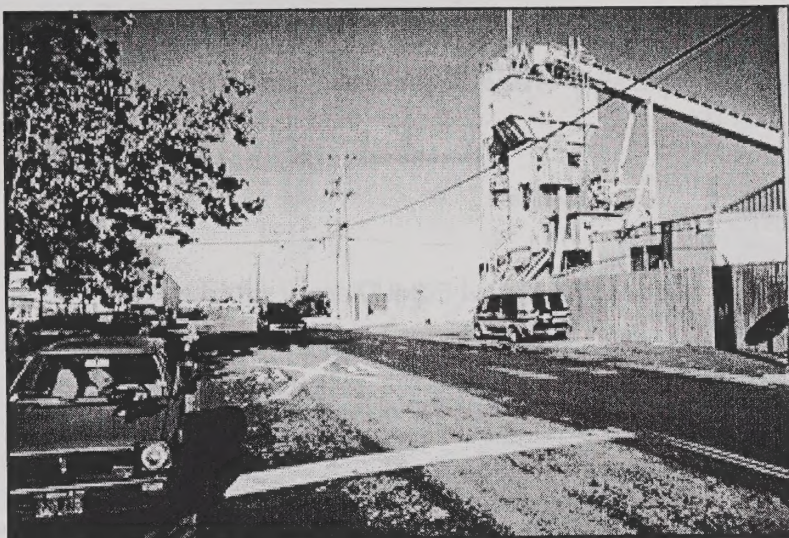


Figure 6: Looking west on Virginia Street from Third Street

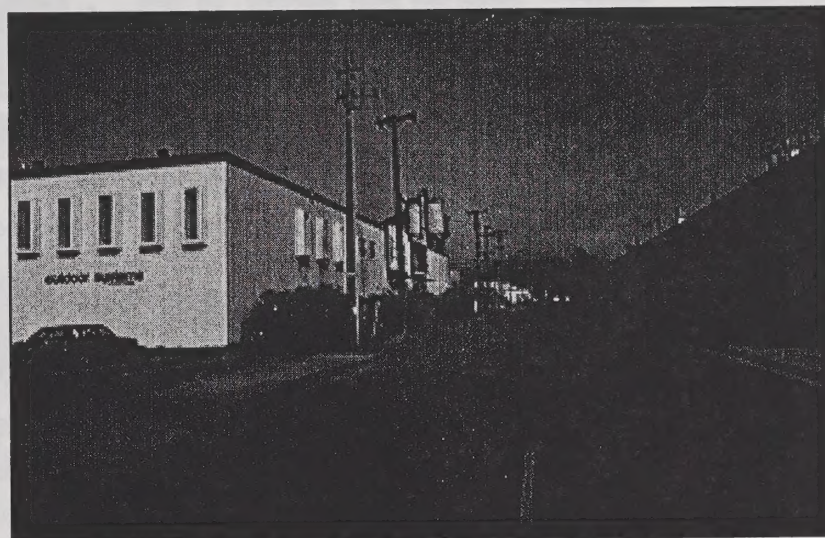


Figure 7: Looking east up Virginia Street from Eastshore Highway

2 Possible Bridge Alignments

Eight possible bridge alignments have been identified in figure 8 on the following page. The matrix below summarizes the findings of this report with respect to possible bridge alignments. Note that the current construction budget is 3 million dollars.

	APPROXIMATE COST (millions) ¹	COMMENTS
AP1	2.47	Conflicts with existing parking and EBMUD sewer interceptor
AP2	2.96	Conflicts with existing vegetation, possible environmental issues, construction and regulatory issues due to span over water
AP3	2.90	Distant from Fourth Street; construction, environmental and regulatory issues due to span over water
AP4	3.10	Terminus to strong urban axis; construction, environmental and regulatory issues due to span over water, distant from Fourth Street
H1	3.63	Would require tight ramping geometry and long main span due to configuration of West Frontage Road; petroleum contamination and acquisition issues
V1	2.58	Would require either 1:14 ramping or encroachment on Second Street; property acquisition required; simple structure, shorter span
V2	2.58	Ties into Bay Trail better than V1 due to looping ramp, otherwise same comments as V2.
V3	2.34	No acquisition required, however users must cross Eastshore Highway
V4	2.58	Difficult acquisition issues, conflicts with existing uses and vegetation

¹These cost figures are based on estimates of total square footage for 1:20 ramping and eighteen foot wide ramping and spanning structures. They are approximate and are best used for comparative purposes only. See appendix 1 for details.

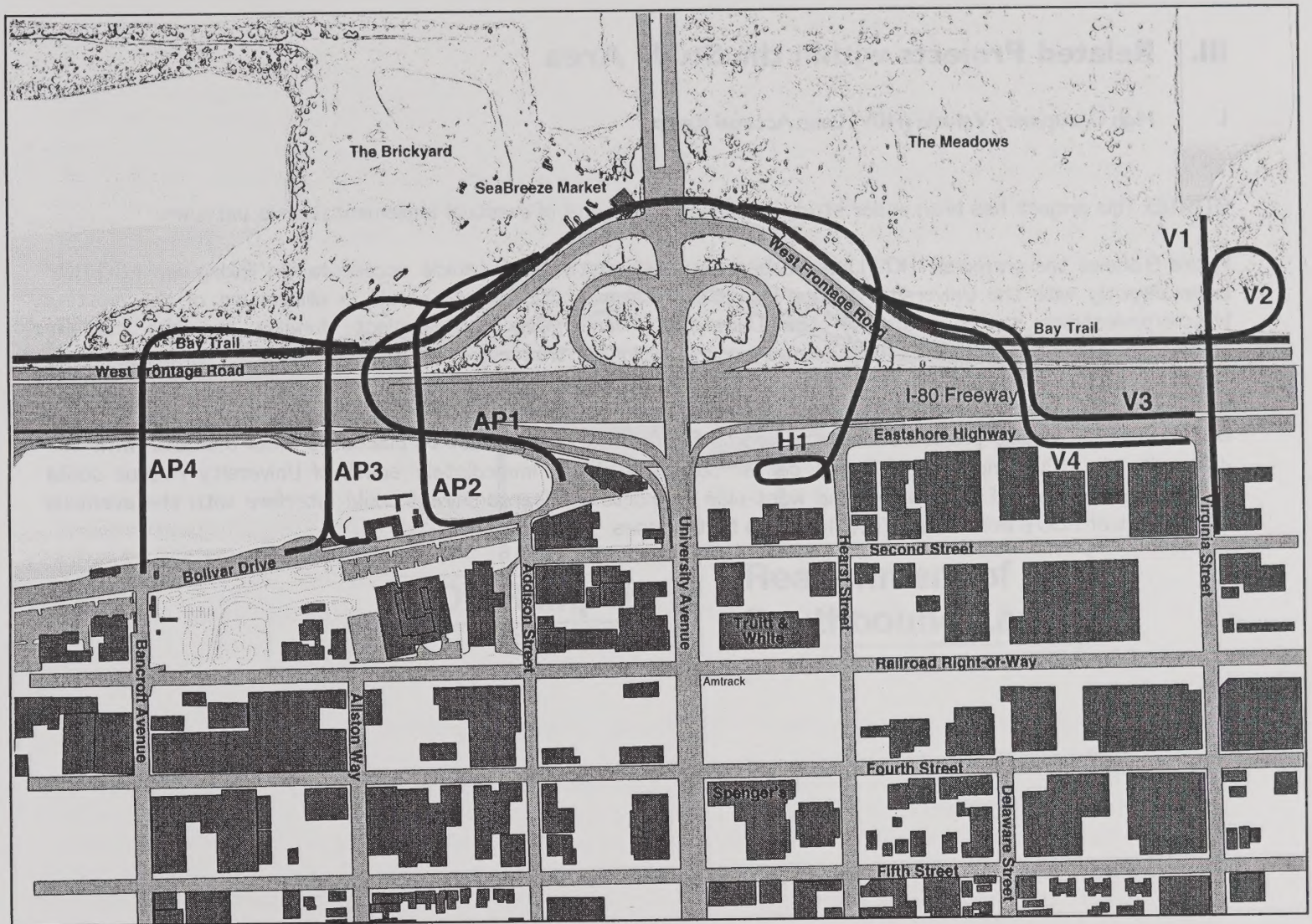


Figure 8: Alternative Bridge Alignments

III. Related Projects within the Study Area

1. High Occupancy Vehicle (HOV) Lane Access Ramps

STATUS: This project has been under study since 1993; likelihood of eventual implementation is unknown.

Figure 9 shows the preferred HOV Lane Access Ramp alternative with vehicle access ramps linking new I-80 HOV lanes directly with the University Avenue Overpass. Implementation would result in elimination of the existing bicycle/pedestrian traffic route on the University Avenue Overpass. Project funding for the current bike/pedestrian bridge project is based largely on mitigation for that eventuality.

Regardless of whether the HOV project is ever implemented, it places significant constraints on the Bike/Pedestrian Bridge project because supports for the new bridge must be placed to avoid conflicts with the design for the HOV ramping. Specifically, center supports placed immediately south of University Avenue could block entry to eventual HOV ramps, and west-side supports at Hearst Street could interfere with the eventual realignment of I-80's west-bound (south-bound) traffic lanes.

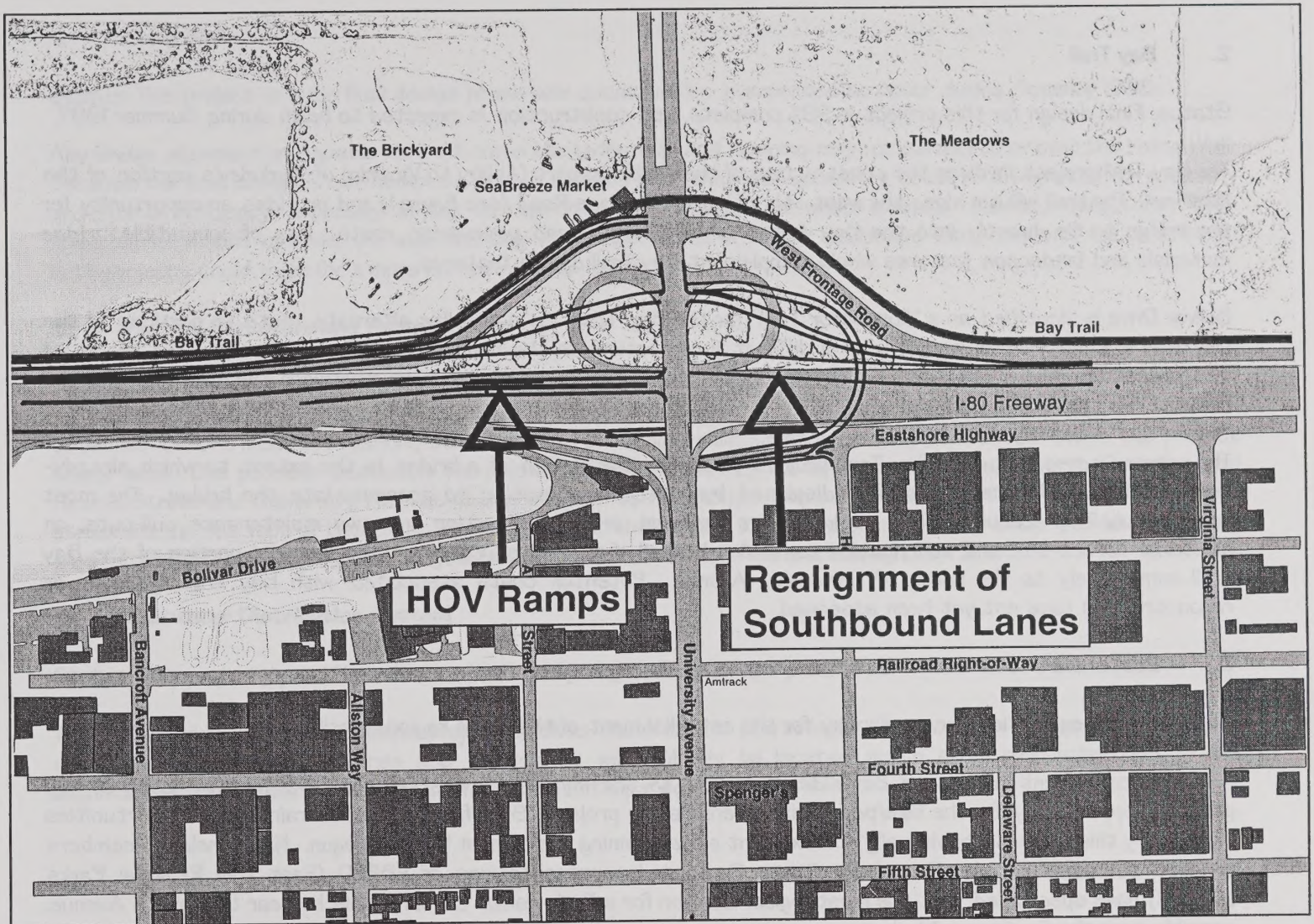


Figure 9: High Occupancy Vehicle Ramp Project (Preferred Alternative)

2. Bay Trail

Status: Final design for this project is 99% complete, and construction is expected to begin during Summer 1997.

The Bay Trail project involves the construction of the southern part (Ashby to Virginia) of Berkeley's portion of the Bay Trail. The trail will run along the west side of West Frontage Road (see figure 1) and provides an opportunity for the bridge to tie directly into the Bay Area's largest bicycle and pedestrian route. Use of compatible bridge materials and landscape features would complement Bay Trail design features.

Bolivar Drive is identified as a "Connector Trail" for the Bay Trail. As a possible alternate route to portions of the Bay Trail in Emeryville, it would avoid a difficult intersection on the main trail at Powell Street. The proposed bike/pedestrian bridge could strengthen the existing weak link at University Avenue between the main trail and the Bolivar Drive connector trail.

The primary constraint the Bay Trail project places on the design of a bridge is the extent to which already-designed Bay Trail features would be displaced by or require alteration to accommodate the bridge. The most notable Bay Trail features which could require redesign or reconstruction are two maintenance pull-outs, an electrical service box, and an irrigation controller box, all of which are located on the diagonal portion of the Bay Trail immediately to the north of University Avenue. Potential costs associated with Bay Trail redesign or reconstruction have not yet been assessed.

3. Eastshore State Park

Status: Final negotiations are underway for the establishment of this large regional facility.

Providing convenient access to Bay-side parklands to the immediate west of the I-80 freeway is one of the greatest opportunities for the bike/pedestrian overcrossing project. Specific design constraints and opportunities imposed by this project are virtually non-existent since planning and design has not begun. Nevertheless, members of CESP (Citizens for the Eastshore State Park), and representatives of EBRPD (East Bay Regional Parks District) have speculated that the most logical location for a Park visitor center would be near University Avenue, possibly near the Seabreeze Market.

4. Living Wall

Status: This project is in its final design phase and construction is expected to occur during Summer 1998.

Any bridge alignment in Aquatic Park will cross the Living Wall and ramping may run parallel to or over the Living Wall. Because the final design is not complete, bridge ramping and Living Wall geometry could be integrated for economy and spatial efficiency, especially at the very north end of Aquatic Park where existing retaining structures limit noise barrier design options. As with the Bay Trail project, use of similar landscape materials and treatments in both projects could make for a more unified regional landscape.

5. Parking Structure and Amtrack Stop

Status: This project is currently under study by the West Berkeley Redevelopment Agency.

Construction of a multi-level parking structure and passenger railroad stop is being considered within the project study area. One possible location is the existing Spengers parking lot between Third and Fourth Streets, and Hearst Street and University Avenue. Bridge alignments with touch-downs in the immediate vicinity of the parking structure, i.e. the foot of Hearst or foot of Addison, the parking structure/transit node could provide a staging area for visitors traveling by foot, bicycle or wheelchair to the Bay Trail and Eastshore Park.

6. Saltwater Distribution System

Status: This project is at the end of its preliminary engineering design phase.

The Saltwater Distribution System project involves the creation of a reliable water source for fire-fighting during emergencies. Since the pipelines and pumphouse will probably be located north of all bike/pedestrian bridge alignments under consideration, no conflicts are anticipated.

7. Existing Bicycle/Pedestrian Bridges in the Region

Appendix G provides a list of all pedestrian overcrossings in Caltrans District 4 (the greater Bay region of northern California.) Resources have not permitted a detailed survey of existing facilities, however some drive-by observations as well as contact with bicycle groups and staff at other cities allow for some general comments and criticisms:

- 1) Most existing non-vehicle overcrossing bridges were designed primarily to accommodate pedestrians and are too narrow to safely or comfortably accommodate both pedestrians and bicycles.
- 2) Many existing bridges incorporate ramp geometry with very tight turns and overhead clearances (sometimes as low as 7'-0" for ramps which spiral or double back on themselves.) This geometry often creates architecturally oppressive spaces and unsafe and functionally difficult conditions.
- 3) Most pedestrian bridges in the region are considered uninviting and unsightly, largely due to lack of architectural character, detailing which does not relate to a pedestrian scale, and use of materials such as chain-link fencing.
- 4) Touch-down points for many existing bike/pedestrian bridges in the region inadequately relate to the surrounding urban fabric--commercial or recreational--and do not tie in with or enhance existing pedestrian use patterns.
- 5) Bike/pedestrian bridges and their ramping structures often create weather sheltering areas, blind corners and other places which lend themselves to concealment, creating a real or perceived threat of danger.

IV. Environmental Considerations:

1. Soil Contamination

Elevated levels of lead and other contaminants exist in all soils along the I-80 freeway corridor in Berkeley, thus construction work at all bridge sites being considered is constrained by the need for a hazardous materials contingency plan and worker training in handling petroleum hydrocarbons and metals. User safety is an additional concern, due to both airborne pollutants and soil contact.

Excessive contamination levels are known to exist at two locations being considered for bridge touch-downs:

a) On the west side of the freeway in the vicinity of Virginia and Delaware Streets (former City dump area), total lead, WET lead, and DI-WET lead concentrations are all high enough to classify soil excavated at this location as a hazardous material (see Appendix 3). Higher excavation and disposal costs may be anticipated if the western touch-down of the bridge is located in this area. These costs could be particularly significant because the high water table at this location is likely to require special water control specifications similar to those being used at the new Cypress structure in Oakland in order to avoid excessive on-site water storage and treatment during construction.

b) At 620 Hearst Street, the approximate location of a 1920's oil refinery, subsurface contamination by petroleum products is known to exist and may be the basis for a possible future lawsuit with the ARCO Corporation. In addition to higher excavation and disposal costs (see Appendix 4), it is possible that the subsurface contamination would need to be remediated by the city upon purchase of a portion of the property.

2. Federal 4(f) lands

The entire Aquatic Park and the Eastshore State Park are considered "4(f) lands" under Federal Transportation Department guidelines. Because the bike/pedestrian overcrossing project is federally funded, the bridge design which is selected must be shown to have "no prudent and feasible alternative". The design must also be shown to include "all possible planning to minimize harm to the affected property." While these requirements may limit

selection among alignments being considered within the Park, designs which can be shown to enhance the Park may receive special consideration in the 4(f) review process.

3. Sensitive Habitats

Most of Aquatic Park is considered a sensitive habitat area, and 2/3 of the park acreage is a tidal wetland. Minor wetland areas may also exist on the west side of I-80 freeway at Virginia Street as well as at Allston Street. Destruction or alteration of any wetland area introduces additional regulatory burdens on the project. Furthermore, if the bridge structure touches water in the Aquatic Park lagoon, the following additional agencies need to review plans for the project:

- Regional Water Quality Control Board
- California Department of Fish and Game
- U.S. Army Corps of Engineers
- U.S. Fish & Wildlife Department

If any portion of the bridge structure comes within one hundred feet of the Bay, then the Bay Conservation and Development Commission must also review plans for the project. (These reviews would be in addition to normal reviews by Caltrans District Four, Caltrans Sacramento, and the Federal Department of Transportation.)

To avoid disturbance of wildlife habitat identified in Aquatic Park, the bike/pedestrian bridge project should:

- maintain gradually sloped shoreline embankments for wading shorebirds
- maintain a storm sheltering area at the north end of the Park for waterfowl
- avoid creating obstructions which could cause bird fatalities among birds which frequently fly between the Park and the Bay
- avoid disruption of over-wintering bird populations if construction takes place during the period between October and April

Additional issues relating to fish populations may exist for bridge structures which touch water.

V. Urban Design and Planning Considerations

1. Existing Use Patterns

Commercial Development along Fourth Street north of University Avenue is an important existing activity center which will derive benefit from a bike/pedestrian bridge, and encourage use of the new bridge, if a strong linkage can be developed. For this and other reasons, streetscape improvements in the vicinity of the bridge and between the bridge and the Fourth Street area have been identified as an important short term planning goal. Nevertheless, it should be noted that the distance from the Fourth Street shopping area is approximately 1/4 mile from the Hearst Street touch-down location -- the distance is widely considered to be the maximum walking distance for shoppers and casual walkers. (see reference, Kelbaugh et. al.)

The quiet nature of existing use patterns at Aquatic Park has been identified by several users and adjacent property owners as a valuable resource which could be affected by increased bike/pedestrian traffic drawn by a bridge. Conflicts between any structures spanning over the main lagoon and water sports activities have been identified as an additional concern.

A number of the vegetated areas on both sides of the I-80 freeway, including the cloverleaves and the Meadows, contain homeless encampments. This has been identified as a potential or perceived safety issue for bridge users.

Truitt and White Lumber Company attracts a significant volumes of truck and other commercial vehicle traffic which could conflict with bridge users at Hearst Street.

The Berkeley Asphalt & Concrete Company generates a significant amount of dust, gravel, heavy truck traffic and noise -- conditions which may not be safe for or compatible with pedestrians or bicyclists for bridges located at Virginia Street.

2. Zoning

Addison Street below Fourth Street is zoned for commercial development. Eventual development on Addison Street may provide a livelier streetscape with more pedestrian activity; it may also result in increased vehicle traffic and parking congestion which may conflict between bridge users and vehicular traffic. On the other hand, the increased pedestrian and bicycle traffic attracted by a pedestrian bridge at Addison Street would add to the success of future commercial development along Addison Street (see figure 10 below).

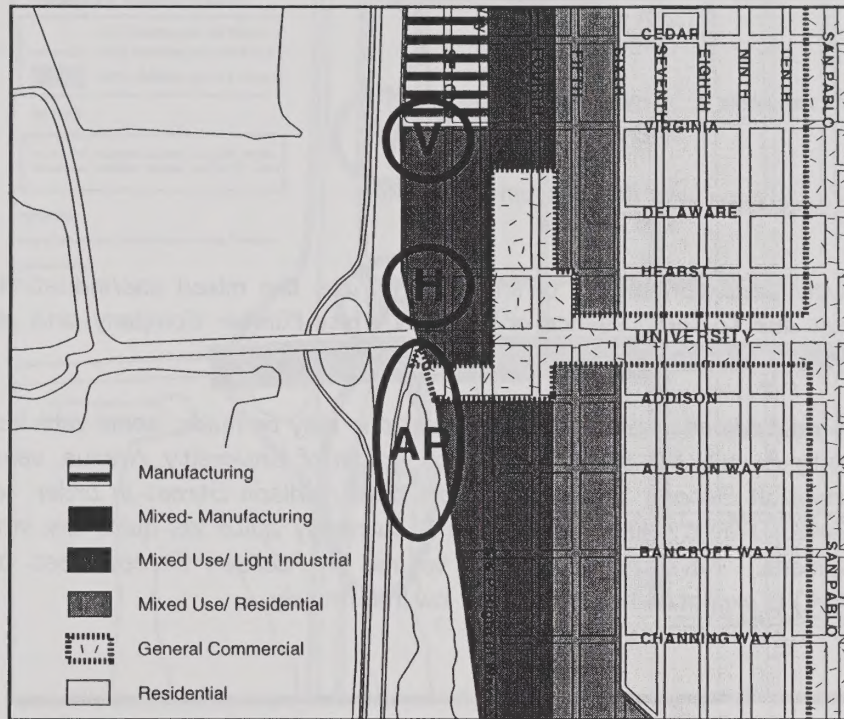


Figure 10: Zoning Map of Project Study Area

3. Vehicular Traffic Volumes, Speeds and Parking

The following chart, and figure 11 below, summarize traffic related information for the project study area.

Traffic Volumes:

<u>Location</u>	<u>24 hour Traffic Volume</u>
Virginia Street at Second Street	251 vehicles
Eastshore Highway at Virginia Street	995 vehicles
Hearst Street at Second Street	828 vehicles
I-80 off-ramp at Hearst Street	916 vehicles
Addison Street at Second Street	no data currently available
Addison Street at Seventh Street	218 vehicles

Traffic volumes at all three sites have a relatively large percentage of truck traffic due the mixed use/industrial nature of the area; particularly at Hearst Street due to the presence of Truitt & White Lumber Company ,and at Virginia Street due to Berkeley Cement and Asphalt Company.

Although no data is available for traffic volumes on Addison Street, a few observations may be made: some vehicles heading northbound on I-80, exiting at University Avenue but bound for points south of University Avenue, veer right twice at the off-ramp and then make a right at Second Street and a left onto Addison Street in order to avoid congestion at University and Sixth Streets. Traffic volume on Addison is currently quite low quite low, but will undoubtedly increase with future development. Nevertheless, traffic volume on Addison Street west of Second Street (traffic heading into Aquatic Park) is expected to remain very low indefinitely.

Traffic Speeds

Vehicular traffic speeds have been identified as a possible design constraint (a safety issue for bridge users) at the northbound I-80 off-ramp at Hearst Street and at the Eastshore Highway at both Hearst and Virginia Streets. Recent speed measurements at these locations indicate that at least 10% of vehicles are traveling at over 45 miles per hour

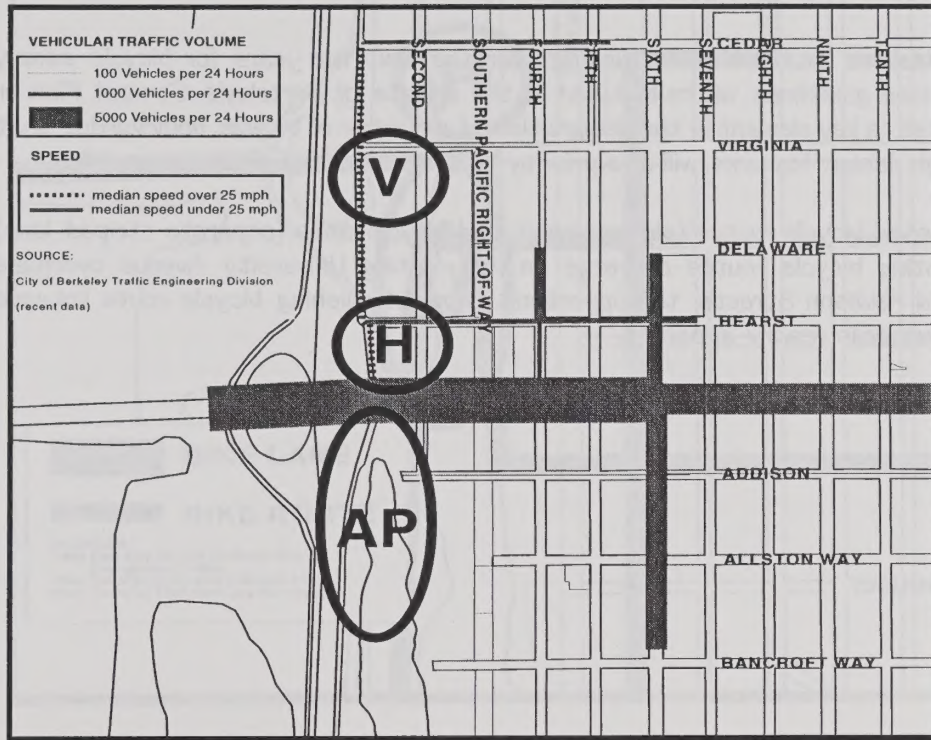


Figure 11: Traffic Volumes and Speeds

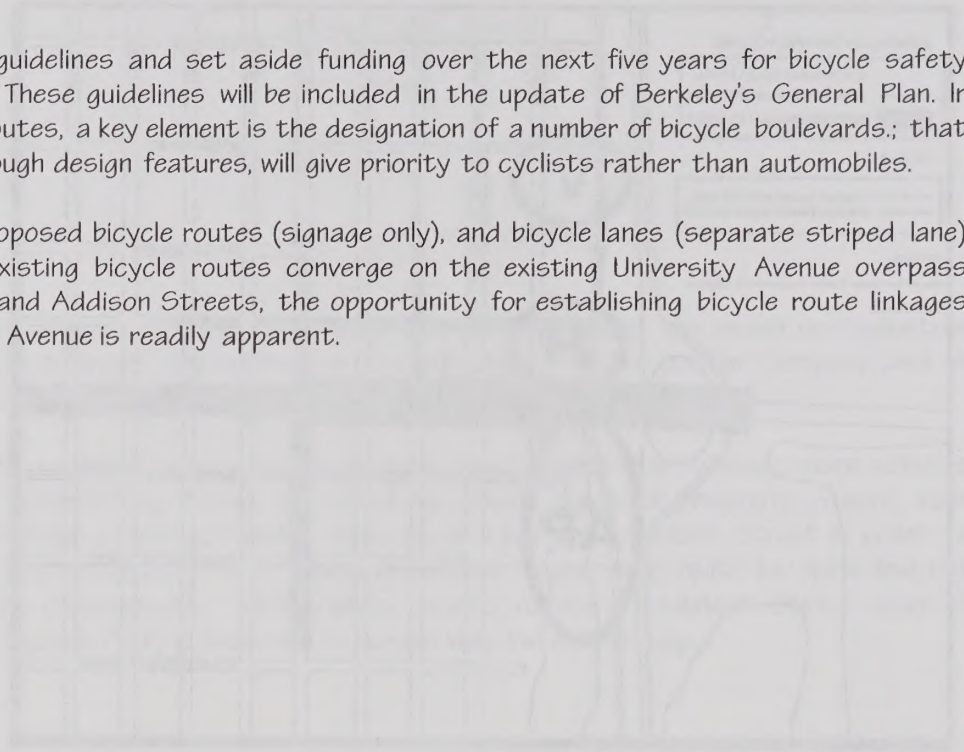
3. Public Transportation Connections

Amtrak trains and AC Transit bus #51 stop at University Avenue, a location equidistant from the sites at the foot of Hearst and the foot of Addison. Further development of this area as transit hub and parking area (see figure 1 above) could create a staging area for access to the bridge.

4. Berkeley Bikeways Plan

The City of Berkeley has developed guidelines and set aside funding over the next five years for bicycle safety improvements throughout the city. These guidelines will be included in the update of Berkeley's General Plan. In addition to current signed bicycle routes, a key element is the designation of a number of bicycle boulevards; that is, existing thoroughfares which, through design features, will give priority to cyclists rather than automobiles.

Figure 11 below shows existing and proposed bicycle routes (signage only), and bicycle lanes (separate striped lane) in the project study area. While existing bicycle routes converge on the existing University Avenue overpass bicycle crossing facility near Hearst and Addison Streets, the opportunity for establishing bicycle route linkages at either Virginia Street or Bancroft Avenue is readily apparent.



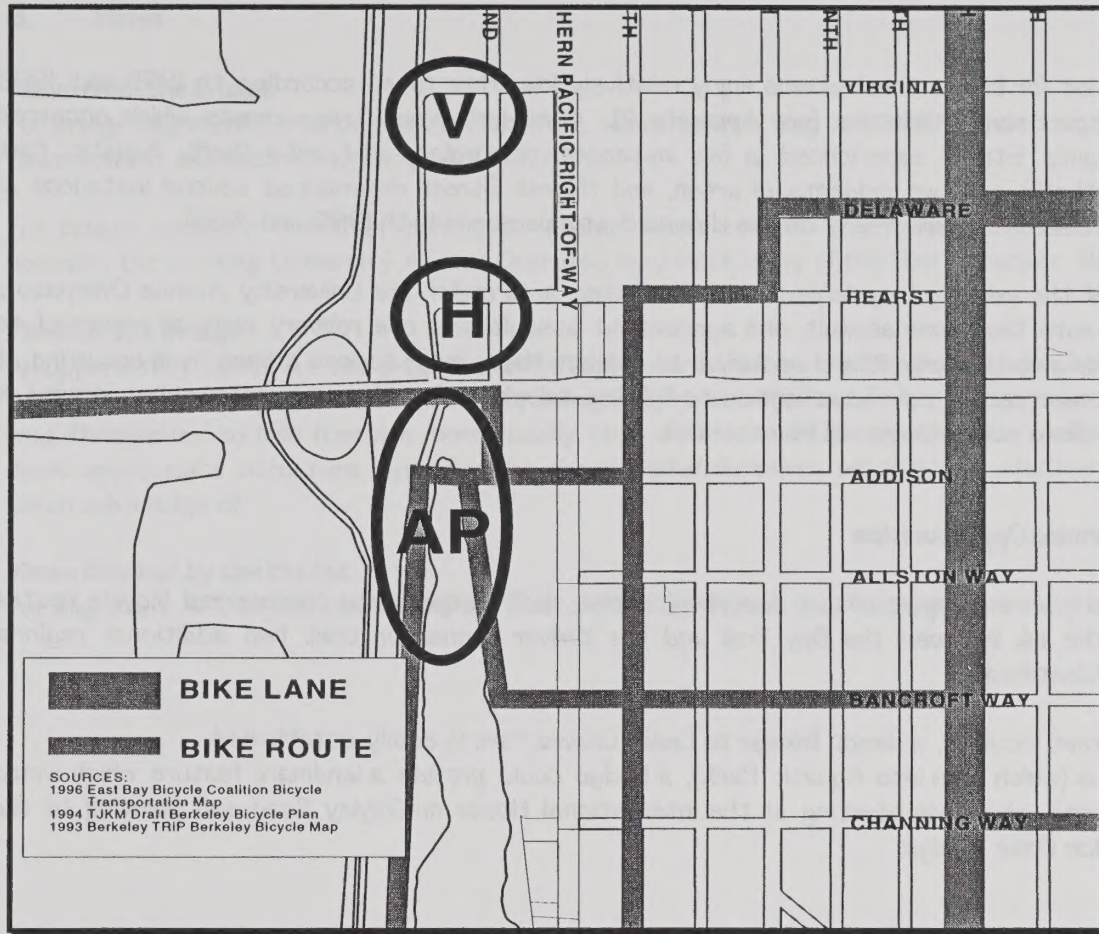


Figure 12: Bicycle Routes in the Project Study Area

6. Public Safety

All sites under consideration for bridge touch-downs enjoy relatively low crime rates according to 1995 and 1996 City of Berkeley Police Department statistics (see Appendix 2). Considering only crime events which occurred west of 3rd street, Virginia Street experienced a few instances of burglary and auto theft, Aquatic Park experienced several auto thefts and two incidents of arson, and Hearst Street experienced several instances of both theft and auto theft. All sites were free of crimes directed at a person in both 1995 and 1996.

In the immediate vicinity of the existing bicycle/pedestrian crossing area under the University Avenue Overpass a theft, a burglary, and an auto theft, one assault, one aggravated assault and one robbery were all reported to have occurred in 1995. This area is poorly lit and secluded; to prevent these more serious crimes from occurring at the new bike/pedestrian overcrossing, careful attention to lighting, telephone locations, ramp geometry, viewing or seating areas, and touch-down plaza design will be essential.

7. Other Regional Planning Opportunities

In addition to the regional planning opportunities described above, such as tying into the regional bicycle routes system, strengthening the link between the Bay Trail and the Bolivar connector trail, two additional regional opportunities have been identified:

- a) At the Virginia Street location, a direct linkage to Cesar Chavez Park is easily established.
- b) At Bancroft Avenue (which runs into Aquatic Park), a bridge could provide a landmark feature which would terminate the strong urban axis starting at the International House on Gayley Road and pointing to the center of the Golden Gate Bridge.

8. Views

Views from the bridge:

For bridge alignments starting in Aquatic Park, views toward the west will include the San Francisco skyline, and views toward the east will look into Aquatic Park.

For bridge locations north of University Avenue views toward the west will include the “Meadows” parkland however, the existing University Avenue Overpass may block views of the San Francisco skyline.

Views of the Bridge:

An opportunity exists for the proposed bicycle/pedestrian bridge to function as a landmark and symbolic gateway to the city as seen by motorists. Certain structure types, such as arches, suspension, or cable-stayed bridges, lend themselves to this function more readily than others, such as concrete box girders. Further study of the most appropriate structure type for the chosen site/alignment will indicate whether this opportunity can be taken advantage of.

Views Blocked by the Bridge:

For alignment AP1, skyline views from the foot of Addison Street may be somewhat blocked.

VI. Geometric Considerations:

1. Ramp Geometry

After budget, space requirements for ramping is probably the greatest project design constraint. To meet clearance requirements over the freeway using a comfortable ramp slope (1:20), ramping at each side of the bridge will need to be between 500 feet and 560 feet, depending on the site. The total length of ramping and spanning structures will exceed 1/4 mile for most alignments under consideration.

While the American Disabilities Act allows for ramp slopes as steep as 1:12, well-established design criteria for long ramps indicates that any ramp slope steeper than 1:20 could prove uncomfortable for most users. Appendix 5 provides additional guidelines on ramp slope design.

2. Cross-Sectional Geometry

Appropriate cross-sectional geometry will be a key factor in determining the ultimate success of the project. The bridge must safely and comfortably accommodate many different types of users traveling at different speeds, and as the Eastshore State Park and Bay Trail become further developed, the proposed bike/pedestrian bridge is expected to experience a high volume of users. Numerous publications on wheelchair, bicycle and pedestrian access were consulted in preparing this report, as well as several Bay Area bicycle and trail planning experts, and bicycle facilities design experts from the Federal Highway Department in Washington, and California and Oregon State Departments of Transportation. Staff observations and a summary of findings from this research follows:

On the need for separation of bicycles from other users:

- Only one expert contacted felt strongly that separation is necessary
- Most experts question the effectiveness of any separation device
- All experts and publications cite separation devices as a potential safety hazard for bicyclists

- Nevertheless, for heavily used facilities, especially for highway overcrossings where required fencing enclosures generally create long tunnel-like spaces, provision of a separation device or refuge areas for pedestrians is considered desirable
- All experts contacted responded favorably to the idea of a low, possibly angled curb (a grade-separating, not a hump-like curb) as a reasonably safe, yet effective separation device which would create a familiar street-to-sidewalk relationship.
- Separation using pavement texture is not deemed practical since wheelchair users will prefer smoother surfaces designed for bicycle users.
- Pedestrians will tend to use both sides of a bridge structure, even if sidewalk facilities are only provided on one side -- this can result in potential conflicts with cyclists.

On the question of widths:

- The Caltrans minimum width of eight feet for pedestrian overcrossing structures is considered inadequate by all parties contacted.
- All experts and publications indicate that 5' is a minimum desirable width for a two-way pedestrian/wheelchair pathway.
- In conjunction with a pedestrian pathway on one side, a total width of ten feet for a two-way bicycle "road" (two four foot lanes separated by a solid stripe, with one foot "shy" distances on each side) is considered adequate by most, especially if a 36" high flat "rub rail" is used in lieu of standard railings.

Span geometry:

The I-80 freeway in Berkeley is one of the most heavily sections of highway in the world. This fact, combined with its narrow center median and restricted opportunities for diverting traffic around any construction activities at the center of the freeway mean that construction of a center support for the bridge may not be economically feasible. The Aquatic Park touch-down location presents particular challenges due to the presence of a retaining wall at the north end of the park (restricting traffic diversion opportunities), as well as the proposed HOV lane ramps described above.

VII. Utilities and Geotechnical Considerations

1. Conflicts with Existing Utilities

A fifty-year old 66-inch diameter East Bay Municipal Utilities District sewer interceptor lies along the west side of Aquatic Park. Ramp alignment and foundation design are severely limited by the sewer location.

Utility poles exist along both Addison and Virginia Streets. At Virginia Street these utility poles would need to be removed (utility lines would need to be "undergrounded") to accommodate alignments V1 and V2.

At Addison Street, removal of utility lines is not necessary for construction, but, along with other streetscape improvements, would help to connect the bridge touch-down area with the Fourth Street Commercial corridor.

2. Soil Conditions

Based on a preliminary review of available geotechnical data, soil conditions are very similar at all three sites under consideration: deep bay mud overlain by shallow sandy fill. These conditions mean that deep steel or concrete friction piles will probably be necessary and that foundation costs will be high for any bridge alignment chosen. The soil conditions also mean that drilled shaft-type foundation systems are not suitable -- this is particularly significant for alignment AP1 where pile driving could damage the EBMUD interceptor mentioned above.

VIII. Administrative Considerations:

Following is a description of administrative considerations which place funding, scheduling or logistical constraints on the project.

Project Activities and Milestones

Design and Permitting Process

The design process for public works and transportation projects is normally broken down into four phases:

- 1) Planning
- 2) Preliminary Engineering
- 3) Plans, Specifications & Estimates (PS&E), and
- 4) Bidding and Construction.

In addition to the Public Process and Design Process components of the project, a sequence of administrative activities is required to satisfy funding and regulatory requirements. These are described in the text and figures 13 and 14 below.

Project Activities and Milestones

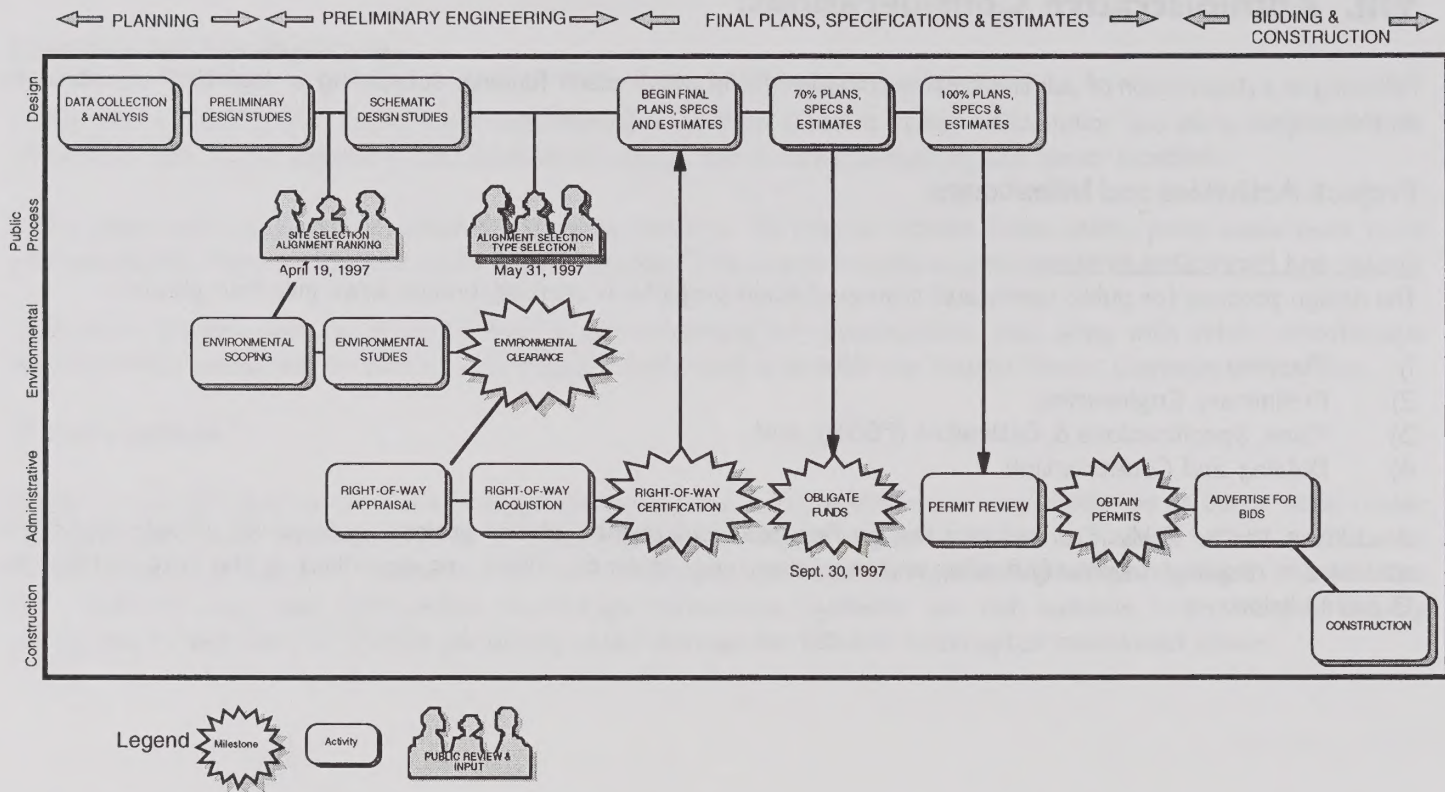


Figure 13: Project Activities and Milestones

Flow of Funds

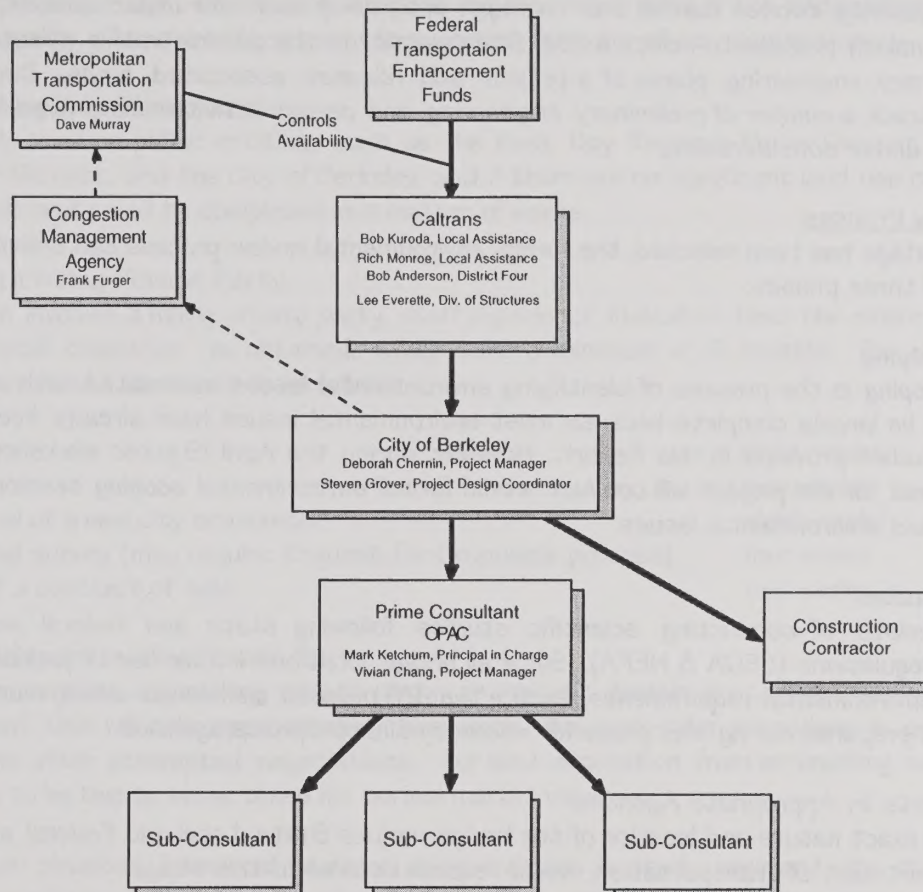


Figure 14: Flow of Project Funds

Site Analysis and Selection

This planning phase activity involves careful and thorough analysis of each site under consideration and a public review and decision-making process to select a site. Site selection is the administrative milestone which typically triggers the preliminary engineering phase of a project and releases associated funds. Because the current project is on a fast-track, a number of preliminary engineering and design activities have already been carried out for each of the sites under consideration.

Environmental Review Process

Once a site for the bridge has been selected, the formal environmental review process can commence. This process typically consists of three phases:

1) Environmental Scoping

Environmental scoping is the process of identifying environmental issues associated with a proposed project. This activity may be largely complete because most environmental issues have already been identified during site evaluation studies provided in this Report. However, during the April 19 public workshop, an environmental consultant retained for the project will conduct a brief formal environmental scoping session to try to identify any still unidentified environmental issues.

2) Environmental Studies

This activity consists of conducting scientific studies following state and federal environmental review procedures and regulations (CEQA & NEPA). Since all bridge locations involve use of parkland, federal funding-related related environmental requirements, such as the 4(f) process mentioned above, must also be satisfied. Documents will be prepared during this phase for review by all appropriate agencies.

3) Review of Documents by Appropriate Agencies

Depending on the exact nature and location of the bridge, various State, Local and Federal agencies, in addition to the State Department of Transportation, would become involved at this stage.

Right-of-Way Acquisition Process

The right-of-way acquisition process cannot begin until after environmental clearance is obtained. For each of the bridge alignments proposed, right-of-way acquisition is required since none of the bridge alignments fall entirely on City of Berkeley property. There are three possible scenarios for right-of-way acquisition:

1) Acquisition Involving Only Public Entities :

If acquisition only involves public entities, such as the East Bay Regional Parks District, Caltrans, East Bay Municipal Water District, and the City of Berkeley, and if there are no significant land use conflicts, the process is relatively simple and could be completed in a matter of weeks.

2) Acquisition from a Willing Private Party:

If land acquisition involves a willing private party, staff experience indicates that the entire acquisition process, after environmental clearance is obtained, would take a minimum of 6 months. The required sequence of activities with estimated durations is as follows:

a) appraisal	eight weeks
b) negotiation	two weeks
c) Council approval of a new city ordinance	eight weeks
d) subdivision and survey (may require Request-for-Proposals process)	four weeks
e) preparation of a contract of sale	two weeks

3) Acquisition Involving an Unwilling Private Party:

If land acquisition involves an unwilling private party, an eminent domain procedure must occur. If a full court procedure is used, this will take approximately two years. If a quick-take procedure is used, this will take at least nine months after attempted negotiations. For land acquisition from an unwilling seller, the price of the property is likely to be two to three times its normal market value.

Based on information obtained from local Realtors doing business in study area and city staff having experience with real estate acquisitions, the current market value for land similar to that being considered for acquisition is approximately \$20 per square foot for whole parcels. For subdivided land purchased from a willing private party,

this value increases to approximately \$30 per square foot, and is the value which has been used by staff in preparing comparative cost estimates for the project.

If acquired land contains a source of pollution, additional construction costs associated with handling and disposal of hazardous materials are incurred, and there is some possibility the city may have to pay to fully remediate the area purchased.

Funds Obligation

The deadline for funds obligation is September 30, 1997. To meet this deadline, PS&E must be sufficiently complete to satisfy Caltrans auditors that the project can be built during the funding cycle and within the budget allocated. Typically, PS&E must be at least 70% complete for funds obligation.

Extensions of the funds obligation deadline are not normally granted for projects in their planning phase. Therefore, if the funds obligation deadline cannot be met, it is important that as much tangible and documented progress be made as possible (e.g. environmental clearance and right-of-way certification) prior to the funds obligation deadline.

IX. References

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XI. Appendices

- 1 Comparative Cost Analysis of Alternative Alignments
- 2 City of Berkeley Police Department Crime Statistics
- 3 Soil Contamination West of I-80
- 4 Soil Contamination at the Hearst Street Touch-down Area
- 5 Ramp Slope Design Guidelines
- 6 Existing Pedestrian Bridges in Caltrans District Four

Location	Align- ment Name	East Touch-down Elevation		West Touch-down Elevation		Depth of Deck	Elev of Freeway	Top Elevation (for 5.6 meter clearance)	Total Climb at East Side	Spans	Ramping for 1:20 slope		Ramping for 1:14 slope		Total Cost per foot of width excluding acquisition costs (Millions)	Acquisition Costs	Total Cost 16' Width incl acquisition (Millions)	Total Cost 18' Width incl. acquisition (Millions)	Total Cost 21' Width incl. acquisition (Millions)
		meters	feet	meters	feet	feet	feet	feet	feet										
Aquatic Park	AP1	2	6.56	3.05	10.01	5	12	35.37	28.81										
Aquatic Park	AP2	2	6.56	3.05	10.01	1.5	12	31.87	25.31										
Aquatic Park	AP3	2	6.56	3.05	10.01	5	12	35.37	28.81										
Aquatic Park	AP4	2	6.56	3.05	10.01	5	12	35.37	28.81										
Hearst Street	H1	2.6	9.19		11	5	11.9	35.27	26.08										
Hearst Street	H2	2.6	9.19		11	5	11.9	35.27	26.08										
Virginia Street	V1		8.3		9.5	5	11.8	35.17	26.87										
Virginia Street	V2		8.3		9.5	5	11.8	35.17	26.87										
Virginia Street	V3		8.3		9.5	5	11.8	35.17	26.87										
Virginia Street	V4		8.3		9.5	5	11.8	35.17	26.87										

Cost per foot of width (Millions)				Cost per foot of width (Millions)				Cost per foot of width (Millions)				1:20 Slope Ramps		1:14 Slope Ramps		Total Cost @ \$30 per sq ft (Millions)		1:20 Slope Ramps		1:14 Slope Ramps		1:20 Slope Ramps		1:14 Slope Ramps	
No. of spans	Total Length	Cost per sq ft (\$)		Length ft	Cost per sq ft			Length	Cost per sq ft							Square Feet to be Acquired									
2	300	240	0.072	1084	60	0.07		758	60	0.05		0.14	0.12			0	0	2.19	1.88	2.47	2.12	2.68	2.47		
1	265	300	0.080	944	90	0.08		660	60	0.04		0.16	0.12			0	0	2.63	1.91	2.96	2.14	3.45	2.50		
7	265	240	0.064	1084	90	0.10		758	60	0.05		0.16	0.11			0	0	2.58	1.75	2.90	1.96	3.38	2.29		
7	265	240	0.064	1084	100	0.11		758	60	0.05		0.17	0.11			0	0	2.75	1.75	3.10	1.96	3.61	2.29		
4	500	240	0.120	1007	60	0.06		705	60	0.04		0.18	0.16			12900	0.387	3.27	2.98	3.63	3.31	4.18	3.80		
4	500	240	0.120	1007	60	0.06		705	60	0.04		0.18	0.16			8800	0.264	3.15	2.88	3.51	3.19	4.05	3.67		
2	280	240	0.067	1051	60	0.06		736	60	0.04		0.13	0.11			8000	0.24	2.32	2.02	2.58	2.24	2.98	2.58		
2	280	240	0.067	1051	60	0.06		736	60	0.04		0.13	0.11			8000	0.24	2.32	2.02	2.58	2.24	2.98	2.58		
	280	240	0.067	1051	60	0.06		736	60	0.04		0.13	0.11			0	0	2.08	1.78	2.34	2.00	2.74	2.34		
	280	240	0.067	1051	60	0.06		736	60	0.04		0.13	0.11			8000	0.24	2.32	2.02	2.58	2.24	2.98	2.58		

City of Berkeley: 1996 Part I Crimes Against Persons (# of incidents by location)



Produced by the City of Berkeley
Data Mapping Project - 3/97

Pollutants

Landfill Debris:

Two types of landfill debris comprise the near-surface materials within the general vicinity of western touchdown locations being considered.

The Meadows:

"The first type is located near Virginia Street and consists of partially incinerated refuse composed mostly of brick, metal and organic material. This debris was placed between 1930 and 1962 and ranges in thickness from three to eight feet and is overlain by three to eleven feet of soil."¹ This area was the former site of the Berkeley City dump and was primarily accessed from Virginia Street.

The Brickyard:

"The second type of landfill debris is located south of University Avenue near a brick yard and consists of brick, concrete and clayey soil of unknown thickness and depth."² In 1990 the City of Berkeley issued a citation for violation of a use permit to Knapp excavators for dumping or storing materials other than clean earth fill at this site. Documents currently available indicate asphalt grindings, and concrete were among the materials being handled on the site at that time. While the environmental study conducted for the Bay Trail project does not indicate concentrations of contaminants in excess of Cal-OSA human health risk standards south of University Avenue, staff is still in the process of determining the extent of soil contamination in this area since excavations for alignments being considered at this location may lie far enough westward of the area tested for the Bay Trail project.

¹ May 24, 1996 Report for Bay Trail facility by Geocon.

² *ibid.*

Task Order No. 04-181210-01
Project No. S8100-06-64
May 24, 1996

CONCLUSIONS

Soil samples obtained from borings B11 and B12 contained total lead concentrations in excess of 130 mg/kg, WET lead concentrations in excess of 5.0 mg/l, and DI-WET lead concentrations less than the laboratory method detection limit. Geocon recommends that if the near-surface soil (upper 61 cm [24 inches]) excavated near borings B11 and B12 is intended to be reused within the I-80 Bike/Pedestrian Facility, then the soil should be managed in accordance with Category 1 of the DTSC variance. If offsite soil disposal is required, near-surface soil materials excavated in the vicinity of borings B11 and B12 should be managed as a hazardous waste based on the STLC concentrations reported for soil samples obtained from within these borings.

The existing data does not allow for confirmation of the source(s) of the TPHd (lubricating oil) impacts. Based on TPHd concentrations in excess of 1,000 mg/kg, the soil excavated near borings B3 and B4 may require characterization during the construction activities and management as a designated waste.



April 11, 1997

Steven Grover
Berkeley Planning Department
Advanced Planning Division
2118 Milvia Street, Suite 300
Berkeley, CA 94704

RE: Potential Environmental Costs
Former Labindustries, Inc. Property
620 Hearst Street
Berkeley, California

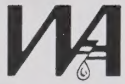
Dear Mr. Grover:

As you requested in our April 8, 1997 telephone conversation, Weiss Associates (WA) has evaluated potential environmental costs that the City of Berkeley may incur from a possible construction project on the property referenced above. The property may be purchased as the site of concrete footings that would anchor the eastern end of a pedestrian bridge spanning the adjacent Highway 80 freeway. Petroleum hydrocarbons from former underground and above ground fuel tanks have impacted soil and ground water beneath the property. The objective of WA's cost evaluation is to provide the Berkeley Planning Department with an assessment of the additional costs due to the presence of petroleum hydrocarbons in the subsurface.

Costs related to the presence of subsurface petroleum hydrocarbons will likely arise from: 1) the city's purchase and ownership of the property; and 2) the excavation of soil for the footing construction. Property ownership will potentially incur significantly higher environmental costs. Environmental regulatory agencies often hold property owners responsible for the investigation and remediation of subsurface releases that have occurred prior to property acquisition. Costs to cleanup soil and ground water at California petroleum release sites to acceptable regulatory standards typically range from \$10,000 to \$1,500,000 over the project lifetime. Although regulatory cleanup standards have relaxed in the past few years, local agencies would probably classify this property as a high priority site due to the presence of separate-phase hydrocarbons. Even if the current property owner agrees to cover all future cleanup costs during the property sale, the city's legal costs to negotiate and uphold the agreement may also be significant over the long term.

Environmental costs emanating from site construction are smaller but more predictable. WA understands that two design options are possible for the bridge's eastern concrete footing. Option 1 specifies installing three 10-ft long, 10-ft wide and 8-ft deep concrete footings, and Option 2 specifies drilling an eight-inch diameter, 100-ft deep borehole and backfilling the borehole with concrete. Additional costs due to the presence of subsurface petroleum hydrocarbons will potentially

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Mr. Steven Grover
April 11, 1997

2

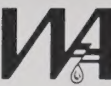
result because from added requirements for three tasks: the characterization and disposal of soil removed from the excavations or boring, the characterization and disposal of ground water removed from the excavations or boring, and worker health protection. Cost estimates for each of these tasks are presented in Table 1, a detailed breakdown is included as Attachment A, and assumptions for the estimates are presented below.

Table 1. Summary of Additional Costs Due to the Presence of Subsurface Petroleum Hydrocarbons

TASK	OPTION 1 (\$)	OPTION 2 (\$)
Soil Characterization and Disposal	3,610	2,455
Ground Water Disposal	6,225	1,815
Worker Health and Safety Protection	3,575	2,575
TOTAL	13,410	6,845

Soil Characterization and Disposal: Regardless of whether excavated soil contains petroleum hydrocarbons, Options 1 and 2 require removal, characterization, transportation and offsite disposal of about 35 and 2 cubic yards of soil, respectively. Based upon the analytic results of soil samples collected from beneath the property, the soil probably would be accepted as non-hazardous waste at the Browning-Ferris, Inc. Altamont Landfill in Livermore, California. The presence of volatile organic compounds, chemicals typically associated with solvents, or high metal concentrations in soil may classify the soil as a hazardous waste and thus result in higher characterization, transport and disposal costs. These higher costs were not considered in this evaluation. The additional costs consist of additional laboratory analyses, slightly higher soil transportation costs, higher landfill fees and more time for coordinating the characterization and disposal.

Ground Water Characterization and Disposal: WA assumed that dewatering of the excavations or boring would be required to install the footings and that removed ground water will be discharged to the sanitary sewer for both options. Although discharge requirements of the East Bay Municipal Utility District (EBMUD), the local publicly-owned treatment works (POTW) district, prohibit ground water discharge, EBMUD often grants variances to this restriction when no alternative use is available for the water. All water, whether impacted or not impacted by petroleum hydrocarbons, must be pumped into an above ground tank, sampled and inspected by EBMUD prior to discharge to the sewer. Additional costs for discharging water impacted by petroleum hydrocarbons would be due to additional EBMUD inspections, additional laboratory analyses, treatment of the water prior to discharge using granulated activated carbon (GAC) vessels, characterization and recycling of the GAC, and increased project oversight.



Mr. Steven Grover
April 11, 1997

3

Worker Health Protection: Construction that involves soil and/or ground water impacted by chemicals of concern requires additional worker protection. It is common practice to hire contractors trained in accordance with 29 CFR 1910.120, Hazardous Waste Site Operations Training, for such projects. Because not all contractors have this training, fewer contractors will be eligible for the project, probably resulting in higher contractor bids. WA did not include increased bid costs due to training requirements in this evaluation. Other additional costs would result from a more detailed worker site health and safety plan, a plan that assesses potential chemical exposures, monitoring of ambient air with an organic vapor analyzer and the use of protective clothing and equipment, including chemical-resistant suits and gloves and respirators.

In addition to the construction costs described above, handling impacted soil and ground water would increase the City of Berkeley's liability in ways that are difficult to quantify. First, although site workers would likely be trained appropriately, the risk of worker injury is increased due to potential chemical exposures. Second, transport of impacted soil on public roadways increases exposure risks to the public. Third, by disposing of the soil at a landfill, the City of Berkeley would become a waste generator for the landfill. As a generator, the city is susceptible to any future litigation that involves the landfill.

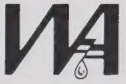
I trust this evaluation meets your department's needs. Please call me at (510) 450-6120 if you have any questions or need additional information.

Sincerely,
Weiss Associates

Thomas Fojut, R.G.
Project Geologist

Attachment A – Estimated Additional Construction Costs Due to Presence of Subsurface Petroleum Hydrocarbons

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ATTACHMENT A

ESTIMATED ADDITIONAL CONSTRUCTION COSTS DUE TO PRESENCE OF SUBSURFACE PETROLEUM HYDROCARBONS



Estimated Additional Construction Costs Due to Presence of Subsurface Petroleum Hydrocarbons

Former Labindustries, Inc. Property, 620 Hearst Avenue, Berkeley, California

SUMMARY

TASK	OPTION 1	OPTION 2
1 - Soil Characterization and Disposal	3,610	2,455
2 - Water Characterization and Disposal	6,225	1,815
3 - Worker Safety Protection	3,575	2,575
TOTAL	13,410	6,845

Task 1: Soil Characterization and Disposal		<-----OPTION 1----->			<-----OPTION 2----->		
EXPENSE	RATE	QUANTITY	UNIT	AMOUNT (\$)	QUANTITY	UNIT	AMOUNT (\$)
Consultant Oversight Labor	75.00	8	hours	600	8	hours	600
Lab: PNAs	250.00	1	analyses	250	1	analysis	250
Lab: CAM17	150.00	1	analyses	150	1	analysis	150
Lab: TPH (2 chromatogram ranges)	115.00	1	analyses	115	1	analysis	115
Lab: O&G	55.00	1	analyses	55	1	analysis	55
Lab: STLC extraction and analysis - 2 metals	170.00	1	analyses	170	1	analysis	170
Lab: VOCs	160.00	1	analyses	160	1	analysis	160
Lab: RCI	225.00	1	analyses	225	1	analysis	225
Lab: Fish Bioassay	330.00	1	analyses	330	1	analysis	330
Trucking	330.00	1	item	330	1	item	330
Landfill Fees	35.00	35	cubic yards	1,225	2	cubic yards	70
TASK TOTAL				3,610			2,455

Task 2: Water Characterization and Disposal		<-----OPTION 1----->			<-----OPTION 2----->		
EXPENSE	RATE	QUANTITY	UNIT	AMOUNT (\$)	QUANTITY	UNIT	AMOUNT (\$)
Consultant Oversight Labor	75.00	20	hours	1,500	12	hours	900
EBMUD Additional Inspections	540.00	2	item	1,080	1	item	540
Lab: TPH	100.00	6	analyses	600	1	analyses	100
Lab: VOCs	140.00	6	analyses	840	1	analyses	140
Lab: CAM 17	135.00	3	analyses	405	1	analyses	135
Granulated Activated Carbon, 55-gallon	400.00	2	vessels	800	0	item	0
Granulated Activated Carbon disposal	500.00	2	vessels	1,000	0	item	0
TASK TOTAL				6,225			1,815

Task 3: Worker Health Protection		<-----OPTION 1----->			<-----OPTION 2----->		
EXPENSE	RATE (\$)	QUANTITY	UNIT	AMOUNT (\$)	QUANTITY	UNIT	AMOUNT (\$)
Consultant Oversight Labor	75.00	34	hrs	2,550	26	hrs	1,950
Organic Vapor Analyzer	100.00	3	days	300	2	days	200
Gloves	2.00	50	pair	100	25	hrs	50
Tyvek Suits	10.00	50	item	500	25	hrs	250
Respirators and Organic Vapor Cartridge Sets	25.00	5	item	125	5	hrs	125
TASK TOTAL				3,575			2,575

DESIGN PRINCIPLES

The publication *Road System and Road Standard*, available in English translation, outlines the design standards of the Directorate of Public Roads of the Public Roads Administration. In this publication, the Norwegian design standards classify pedestrian and bicycle facilities in three ways, as shown below. The document includes discussion of the key design elements for each classification.

• Independent (not parallel to roadway) Ped/Bike Path in Rural Area - PB1:

Pavement width for this high-type facility is recommended to be between 2.5 and 3 meters. Gravel shoulders of 0.25 meters

in width are recommended, as are open ditches (as needed for drainage).

Vertical and horizontal alignments should be kept as smooth as possible; these paths should offer efficient transportation with as little extraneous curvature and gradients as possible. The minimum radius for horizontal curvature is 15 meters, while stopping sight distances are given for flat (20 meters required) and downhill (40 meters required).

Cross-slopes are to be no greater than 3 percent. Pavement width should be kept constant through underpasses, and vertical clearance at underpasses should be a minimum of 2.25 meters, with a preferred clearance of 2.75 meters. The chart on this page indicates the maximum values for climbing gradient for the different types of path users.

Requirements for sight triangles at intersections of roadways and other pedestrian/bicycle paths are dis-

cussed, along with a brief section on the use of roadway lighting on a case-by-case basis. A minimum of 0.5 meters is the recommended safety clearance (clear zone), measured from edge of pavement. Another consideration for establishment of safety clearance widths is the need to provide adequate width for maintenance vehicles and operations. The building set-back distance should be no less than 2 meters from the outer edge of shoulder (not edge of pavement).

• Independent Ped/Bike Path in Medium Density Built-up Area:

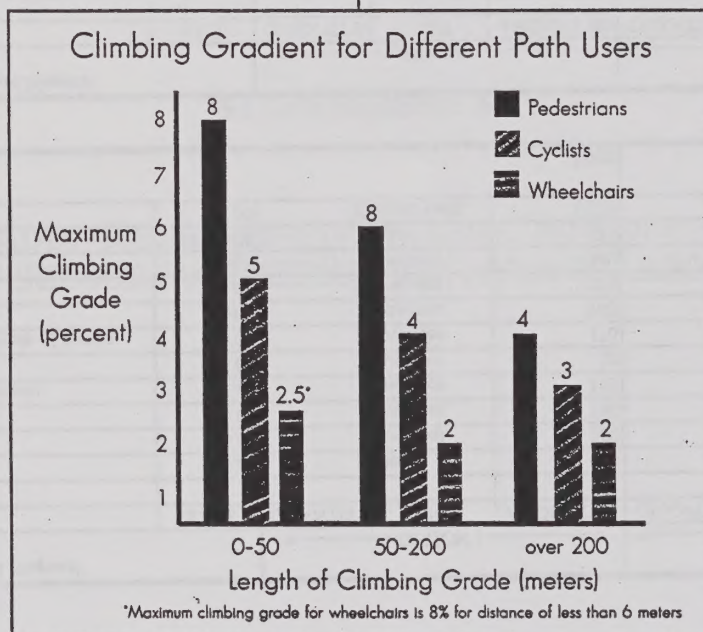
It is interesting to note that in some cases, in residential developments, pedestrian/bicycle paths may be used

by cars solely for access to homes—with a maximum of 12 dwelling units allowed on a single ped/bike path, as long as adequate pavement width is provided. In general, for this classification, the pavement width being recommended is 3 meters, with 4 meters preferred when combined pedestrian/bicycle traffic exceeds 50 in the 15-minute peak period. A narrower pavement width may be used only where detailed analysis of traffic and maintenance aspects so indicate. The alignment standards for PB1 as

outlined above also apply to PB2.

• Pedestrian Street in Urban Area - PB3:

This facility type generally excludes bicycle riders; cyclists must walk their bikes if a separate path or space for riders has not been provided. Adequate parking facilities for the expected volume of bicycles should be provided. The pedestrian street must be designed to allow small delivery vehicles to have access to the shops and



OCTOBER-1995

LOG OF BRIDGES ON STATE HIGHWAYS

PREFACE

BRIDGE LIST ITEMS AND KEYS TO CODED INFORMATION

Location

Entries in **BOLD** type show **DISTRICT-COUNTY-ROUTE**. Other entries show postmile prefix followed by postmile to the nearest hundredth of a mile. Prefixes of R, M, and N refer to re-aligned routes. Prefix L refers to a section of route paralleling another route.

Bridge Number

Suffix, when used, is coded as follows

- C Center structure
- E Connector structure
- F Connector structure
- G Connector structure
- H Connector structure
- J Outer outer left
- K Left outer highway structure
- L Left structure or left inner structure
- M Buried hazard or miscellaneous structure
- R Right structure or right inner structure
- S Right outer highway structure
- T Outer outer right
- W Drainage pumping plant
- Y Structure on State-owned and maintained connections not on main highway (may be closed)
- Z Access to private property or closed with no access

Name or Description

This column contains either the bridge name or, in bold type, miscellaneous descriptive information. Additional descriptive information may be found in bold type in the next column (Structure Types)

Structure Types - Main and Approach Spans

Code for main span type followed by approach span type (if different). See Page iii for codes.

City

CalTrans alphabetic code for cities. Table 2 shows the full city names corresponding to these codes. Where a name is preceded by an asterisk, it indicates a bridge on government lands not within any city limits.

Bridge Length

Length of the structure from paving notch to paving notch in meters.

Width

The out-to-out width of the structure to the nearest tenth of a meter. For through structures, the lateral clearance between superstructure members is shown. For flared structures, the minimum deck width is shown. No width is shown for non-grade-top culverts or structures not carrying vehicular traffic, such as underpasses or pedestrian overcrossings.

PREFACE

LOG OF BRIDGES ON STATE HIGHWAYS

OCTOBER-1995

BRIDGE LIST ITEMS AND KEYS TO CODED INFORMATION

Number of Spans

The number of spans in the structure. Upper-level spans of double-deck structures are not included in this count.

Route VC Left and Route VC Right

The minimum vertical clearance over the traveled way portion of the ROUTE in METERS. The right roadway is on the right, looking ahead on ROUTE. In the case of arches, tunnel, through trusses, etc, where the minimum clearance does not give a true picture, an asterisk ("*") is shown after the clearance. Where only a single clearance is available, it is shown as a LEFT clearance.

Right Sidewalk Width and Left Sidewalk Width

The minimum width of sidewalks or curbs to the nearest tenth of a meter. Where this value is 1 meter or greater, the structure is considered to carry pedestrian traffic.

Year Built (Original Construction) and Year Widened or Extended

For some older bridges, the year of original construction may be a best estimate.

Permit Rating

Usually a string of 5 characters showing permit capacity for 5,7,9,11 and 13 axle vehicles. Where a single character is shown, it represents an "administrative" rating.

- P Purple permit capacity
- G Green permit capacity
- O Orange permit capacity
- X No permit capacity

Do not use this information for permit issuance. For detailed permit information, contact the DISTRICT PERMIT ENGINEER.

P (Posting or Conditional Permit Rating)

- B Open. Posting recommended
- D Open under temporary conditions
- E Open. Temporary structure
- G New structure. Not yet open
- K Closed to all traffic
- M Closed or partially closed pending repairs
- P Posted for load
- R Posted for other load-capacity restrictions
- * See APPENDIX A for conditional permit rating.

BRIDGE LIST ITEMS AND KEYS TO CODED INFORMATION

Three-Character Codes For Structure Type**First Two Characters**

BT Combination truss (combined materials)
 CA Concrete arch
 CB Concrete box girder
 CC Concrete box culvert
 CD Concrete dam
 CG Concrete girder
 CP Concrete pipe
 CS Concrete slab
 CT Concrete truss
 CU Concrete arch culvert
 CW Concrete retaining wall
 ED Earth dam
 EW Reinforced earth retaining wall
 LS Log stringer
 MA Masonry arch
 MP CMP or multi-plate
 PB Precast concrete box girder
 PG Precast concrete girders
 PS Precast concrete slab
 QA Precast prestressed slab or slab units
 QB Cast in place prestressed box girder
 QG Cast in place prestressed girder (not box)
 or PC/PS girder not described elsewhere
 QI Precast prestressed I girder
 QJ Precast prestressed double T girder
 QK Precast prestressed T girder
 QS Cast in place prestressed slab
 QT Precast prestressed inverted T girder
 QU Precast prestressed inverted U girder
 QW Precast prestressed inverted W girder
 QX Precast prestressed box girder
 SA Steel arch
 SB Steel box girder
 SG Steel plate girder
 SP Steel pipe (girder)
 SS Steel stringer (rolled sections)
 ST Steel truss
 SU Suspension
 SW Steel retaining wall
 TA Timber arch
 TB Timber slab (laminated)
 TS Timber stringer
 TT Timber truss
 TU Tunnel
 TW Timber retaining wall

Third Character

A Welded
 B Box (box girder - not used if other coding applies)
 C Continuous
 D Deck
 E Continuous with standard cantilevered ends (no abuts.)
 F Earth fill
 H Deck continuous
 I Continuous over inclined bents
 J Welded continuous
 K Pier or tower span
 L Through continuous
 O Open spandrel
 P Pony
 Q Prestressed (not used if other coding applies)
 R Orthotropic
 S Stayed
 T Through
 W Sidewalk
 X Vertical lift
 Y Bascule
 Z Rotary or swing

Special Three-Character Codes:

SLS = Seal Slab
 FER = Ferry Boat

Examples:

CGC = Concrete girder - continuous
 STD = Steel deck-truss
 STT = Steel through-truss
 CAO = Open spandrel concrete arch

BRIDGES

Bridge Log													
County	Route	Postmile	Bridge #	Structure Name	Structure Types	City	Bridge Length	# of Spans	Route VC		SIDEWALK WIDTHS		Yr. Built
									Left	Right	LEFT	RIGHT	
ALA	13	4.85	33 0161	LEONA HTS/POC	CBC-CSC	OAK	75.0	6	5.23	5.35			1966
ALA	13	7.91	33 0244	BRUNS DR./POC	SSL	OAK	92.9	8	6.27	5.08			1956
ALA	84 R	3.21	33 0518	DUMBARTON/POC	QBC	FMT	150.6	4	5.51				1986
ALA	580	30.9	33 0194	LK CHABOT/POC	QBC		270.7	10	5.63	5.58			1988
ALA	580	43.75	33 0313	VAN BUREN AVE/POC	QSC-CBC	OAK	172.5	7	4.64	4.62			1962
ALA	580	4.74	33 0312	SANTA CLARA/POC	QS-CBC	OAK	114.9	3	4.8	4.62			1962
ALA	880	16.03	33 0282	ELDRIDGE AVE/POC	PGT	HAY	102.4	5	4.57	4.59			1958
CC	24 R	2.4	28 0253	ORINDA WAY/POC	CGL		68.5	6	5.43	5.28			1969
CC	80	0.5	28 0156	SACTO AVE/POC	QU	RCH	56.0	4	4.77	4.57			1960
MRN	101	4.75	27 0076	STRAWBERRY/POC	QIT		131.0	2	5.18	5.18			1957
MRN	101	8.29	27 0078	GREENBRAE/POC	QIT	LKSP	52.7	2	5.23	5.13			1959
MRN	101	11.41	27 0050	COLEMAN SCH./POC	SPA-CS	SRF	193.5	4	6.22	6.78			1969
SCL	17	6.65	37 0137	LOS GATOS/POC	SGT	LGTS	107.6	5	4.57	4.67			1956
SCL	85	6.2	37 0478	RUSO DR/POC	CBC	SJS	206.4	4			0.3	0.3	1991
SCL	85	7.3	37 0480	DENT AVE/POC	QBC	SJS	64.3	2			0.3	0.3	1991
SCL	85 R	12.45	37 0523	MORE AVE/POC	CMB		320.7	10	6.12	5.68		0.3	1994
SCL	85	14.9	37 0482	BLUE HILLS/POC	CBC	CPO	149.3	4	5.79	5.79			1991
SCL	85 R	19.39	37 0243	THE DALLES/POC	CBC	SUNV	85.5	6	5.38	5.43			1965
SCL	101	44.64	37 0395	AHWANEE AVE/POC	QBC-CS	SUNV	167.0	6	5.94	5.66			1976
SCL	101	52.01	37 0323	OREGON EXP/POC	QJ-CB	PA	303.6	15	6.75	6.5			1968
SCL	280 R	4.24	37 0322	COLLEGE DR./POC	QBC	SJS	166.4	3	10.05	10.66			1972
SCL	280 L	5.58	37 0192	MONROE ST./POC	CBC	SJS	217.0	18	5.81	5.68	0.3	0.3	1964
SCL	280	5.11	37 0215	CYPRESS AVE./POC	CBC	SJS	301.2	4	5.63	5.51	0.3	0.3	1989
SCL	680 M	0.78	37 0351	SUNSET AVE/POC	QBC-CBC	SJS	250.3						1974
SCL	680 M	2	37 0291	MADDEN AVE/POC	QBC-CS	SJS	94.5	4	6.62	7.11			1974
SCL	680 M	5.83	37 0340	TRIMBLE RD/POC	QBC-CBC	SJS	205.7	6	6.24	6.19			1974
SCL	85	9.79	37 0502	SMRTAN PL/POC	QBC	SJS	117.9	4	5.84	5.74	0.3	0.3	1994
SF	101	0.7	34 0031	HARKNESS AVE/POC	CBC-CS	SF	67.0	4	5.23				1970
SF	101	2.61	34 0102	FAITH ST./POC	QX-CG	SF	138.4	8	4.95	5.51			1968
SF	101	3.27	34 0050	25TH ST./POC	SGA	SF	47.2	1	4.85	5.02			1953
SF	101	3.53	34 0051	22ND ST./POC	SGA	SF	38.7	1	4.77	5.33			1953
SF	101	3.96	34 0048	18TH ST./POC	STT	SF	38.4	1	5.28	5.18			1953
SF	280 R	1.06	34 0096	WHIPPLE AVE./POC	CBC	SF	74.0	4	7.59	5.23			1964
SF	280 R	2.04	34 0093	HAVELOCK ST./POC	CBC	SF	158.2	9	5.3	5.48			1964
SF	280 R	2.62	34 0078	THERESA ST./POC	CBC	SF	134.4	10	5.25	6.45			1964
SF	280 R	2.81	34 0084	LAMARTIN ST./POC	CBC	SF	145.7	6	5.46	6.04			1964
SF	280 R	3.53	34 0076	ST. MARYS/ POC	CBC	SF	104.5	5	7.72	7.06			1963
SM	1 R	44.04	35 0240	SAN JOSE AVE/POC	PB	PFA	84.7	6	5.05	5.02			1968
SM	1 R	44.88	35 0188	MILAGRA DR./POC	CBC	PFA	157.3	10	5.33	6.01			1965
SM	84	25.13	35 0251	STAMBAUGH/POC	QX-CS	RDWC	179.8	5	5.25	5.38			1967
SM	101	2.57	35 0143	RINGWOOD AVE/ POC	QGT	MLP	90.8	6	4.77	4.82			1958
SM	101	13.95	35 0134	MT DIABLO AVE/POC	CGC	SM	86.2	6	4.67	4.64			1953
SM	101	22.28	35 0124	CALIFORNIA ST./POC	CG	SSF	176.5	1	4.72	4.72			1947
SOL	780	6.66	23 0133	HOME ACRES/POC	CSC	BEN	60.9	4	5.08	5			1960
SON	101	4.55	20 0247	KENILWORTH/POC	CB	PET	197.2	10	5.89	5.71			1971
SON	101	19.54	20 0218	EARLE ST./POC	QK	SRO	175.3	14	7.17	5.99			1963
SON	101	19.94	20 0219	SONOMA AVE/POC	QT	SRO	170.1	12	5.79	5.38			1968

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